

XII.—Notes on the Pangoninæ of the Family Tabanidæ in the British Museum Collection. By Miss GERTRUDE RICARDO.

[Plate I.]

THE present paper embodies the results of an attempt to re-arrange the specimens of Pangoninæ in the British Museum collection, dealing only, so far, with *Pangonia*, Latreille, and its allied genera. Little seems to have been added to our knowledge of the Pangoninæ since the publication of 'Dipteren-Fauna Südafrika's' by Loew, nearly forty years ago, in which he gave a valuable summary of the genera of the above, besides the description of species. Rondani, in Archiv. Canestr., three years later, suggested a subdivision of *Pangonia*, Latreille, which has been carried out in this paper. Schiner in 'Reise der Novara' (1866), and other authors of a later date, have established four or more new genera and described new species. The only catalogues of any species of Pangoninæ were those included in Schiner's 'Cat. European Diptera' (1863), Osten Sacken's 'Cat. N. Amer. Diptera' (1878), and Wulp's 'Cat. Diptera S. Asia' (1886). I hope those I have compiled will prove fairly complete, and be of some use in the future study of the family, together with a few notes on the species possessed by the British Museum, including the description of eleven new species. Any fresh specimens of Pangoninæ, to be added to the National collection, would be most acceptable and greatly facilitate further study, especially as regards the Walker types, many of which are in such poor preservation that it is difficult to form any opinion on them; when further modern specimens are available for comparison, more of these types will very probably prove to be synonymous.

The family Tabanidæ is divided into two divisions, viz. :—

Hind tibia with spurs. Ocelli usually present . . . . .	PANGONINÆ.
Hind tibia without spurs. Ocelli absent. . . . .	TABANINÆ.

*PANGONINÆ.*

The following table of genera of the Pangoninæ of the world compiled from different authors I have found useful to work by, carrying it so far as to include *Pangonia*, Latr., and the genera divided off from it; *Silvius* and its allied genera to follow later.

## PANGONINÆ.

Hind tibia with spurs. Ocelli usually present.

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|--|--|
| 1. Third joint of antennæ with eight or at least seven divisions. Proboscis usually prolonged . . . . .                | 3.   |
| 2. Third joint of antennæ with five divisions. Proboscis short . . . . .   | 14 ( <i>Silvius</i> &c.).                                    |
| 3. Third joint of antennæ with a tooth . . . . .   | <i>Dicrania</i> , Macq.                                      |
| Third joint of antennæ with no tooth . . . . .   | 4.   |
| 4. Wings short; body flat, elliptical . . . . .  | <i>Apocampta</i> , Schiner.                                  |
| Wings not short . . . . .  | 5.   |
| 5. Third joint of antennæ with each segment branched . . . . .   | <i>Pityocera</i> , Gigl.-Tos.                                |
| Third joint of antennæ not branched . . . . .  | 6.   |
| 6. Upper corner of eyes terminating in an acute angle . . . . .  | <i>Goniops</i> , Aldrich.                                    |
| Upper corner of eyes not terminating in an acute angle . . . . .   | 7.   |
| 7. Antennæ deep-seated, inclined downwards. Palpi very large and thick . . . . .                                       | <i>Cadicera</i> , Macq.                                      |
| Antennæ not deep-seated nor inclined downwards. Palpi not very large and thick . . . . .                               | 8.   |
| 8. Antennæ subulated; proboscis with terminal lips in form of a hatchet; anal cell open and anal vein curved . . . . . | <i>Pelecorhynchus</i> , Macq.<br>= <i>Cenopygya</i> , Thoms. |
| Antennæ not subulated; proboscis simple; anal cell closed, anal vein not curved . . . . .                              | 9.   |
| 9. Proboscis scarcely extending beyond palpi . . . . .   | <i>Apatolestes</i> , Will.                                   |
| Proboscis extending beyond palpi . . . . .   | 10.  |
| 10. Wings with fourth posterior cell closed . . . . .  | <i>Scione</i> , Wlk.<br>= <i>Dictisa</i> , Schiner.          |
| Wings with fourth posterior cell open . . . . .  | 11.  |

## PANGONIA, Latr.

- |   |                               |
|---|-------------------------------|
| 11. Wings with first posterior cell closed . . . . .                            | } <i>Pangonia</i> , Rond.     |
| 11 a. Eyes naked . . . . .  |                               |
| 11 b. Eyes hairy . . . . . subgenus   | } <i>Erephrosis</i> , Rond.   |
| 12. Wings with first posterior cell open . . . . .                              |                               |
| 12 a. Eyes hairy . . . . .  | } <i>Diatomineura</i> , Rond. |
| 12 b. Eyes bare . . . . . subgenus  |                               |
| 13. ? Antennæ long and narrow. Wings with first posterior cell closed . . . . . | ? <i>Mycteromyia</i> , Phil.  |

The three genera *Apocampta*, Schiner, formed for *A. nigra*, *Pityocera*, Gigl.-Tos, formed for *P. festæ*, *Goniops*, Aldrich, formed for *G. hippoboscoïdes*, containing only the one species each; *Apatolestes*, Williston, formed for *A. comastes*, and *Mycteromyia*, Philippi, formed for *Pangonia conica*, Bigot, and others, are not represented in the Museum Collection, so that I have no knowledge of them; the last genus is probably a doubtful one.

*Sackenymia*, Bigot (Ann. Soc. Ent. Fr. (5) ix. 1879),

formed for *Pangonia fulvithorax*, Wiedem., and *analis*, Fabr., and others, must be merged again in *Pangonia*, having no distinctive characteristic to justify a new genus.

The following is a list of the described species of the five first-mentioned genera :—

APOCAMPTA, Schiner, Reise der Novara (1866); Verh. zool.-bot. Gesell. Wien, xvii. p. 310 (1867).

*A. nigra*, Schiner, l. c.—*Hab.* Sydney.

PITYOCERA, Gigl.-Tos, Boll. Mus. Torino, xi. no. 224 (1896), xii. no. 226 (1897).

*P. festæ*, Gigl.-Tos, l. c.—*Hab.* Darien.

GONIOPS, Aldrich, Psyche, vi. (1892).

*G. hippoboscoides*, Aldrich, l. c.—*Hab.* Dakota.

APATOLESTES, Williston, Ent. Amer. i. no. 1 (1885).

*A. comastes*, ♀, Will. l. c.—*Hab.* California.

? *A. Eiseni*, Townsend, P. Calif. Ac. (2) iv. p. 596 (1895).—*Hab.* Lower California.

MYCTEROMYIA, Philippi, Verh. zool.-bot. Gesell. Wien, xv. (1865).

*M. conica*, Bigot, l. c. [*Pangonia conica*, Bigot, Ann. Soc. Ent. Fr. sér. 3, v. p. 278 (1857).]—*Hab.* Chili.

*M. brevisrostris*, Philippi, Verh. zool.-bot. Gesell. Wien, xv. p. 713 (1865).—*Hab.* Chili.

*M. fusca*, Philippi, l. c. p. 712.—*Hab.* Chili.

*M. murina*, Philippi, l. c. p. 713.—*Hab.* Chili.

*M. nigrifacies*, Bigot, Mém. Soc. Zool. Fr. v. p. 607 (1892); Wulp, List Dipt. S. Asia (1896).—*Hab.* India.

*M. ensata*, Bigot, l. c. p. 608.—*Hab.* Cape of Good Hope.

*M. elegans*, Bigot, l. c. p. 608.—*Hab.* Cape of Good Hope.

*M. nitens*, Bigot, l. c. p. 609.—*Hab.* Brazil.

*M. penicillata*, Bigot, l. c. p. 610.—*Hab.* Brazil.

*M. cinerascens*, Bigot, l. c. p. 610.—*Hab.* Chili.

*M. albipectus*, Bigot, l. c. p. 611.—*Hab.* Brazil.

*M. erythronotata*, Bigot, l. c. p. 612.—*Hab.* Brazil.

Those species marked with an asterisk (\*) are in the Museum Collection.

#### DICRANIA, Macq.

*Dicrania*, Macq. Dipt. Exot. i. p. 110 (1838); Loew, Dipt. Südafrik. p. 15 (1860).

The described species of *Dicrania* are :—

\**Dicrania cervus*, Wiedem., Auss. zweifl. Ins. i. p. 94 (1828); Macq., Dipt. Exot. i. p. 110 (1838); id. Ann. Soc. Ent. Fr. vi. p. 438, pl. xv. (1837); Giglio-Tos, Boll. Mus. Torino, xii. (1897). [*Pangonia cervus*, Wiedem., l. c. *Pangonia comprehensa*, Walker, Dipt. Saund. pt. i. p. 11 (1850). *Pangonia cervus*, var., Walker, List Dipt. pt. v.

Suppl. 1, p. 131 (1854). *Pangonia ramicornis*, Walker.]—*Hab.* Amazons, Brazil.

*Dicrania furcata*, Wiedem., Auss. zweifl. Ins. i. p. 99 (1828); Walker, List Dipt. pt. v. Suppl. 1, p. 131 (1854); Macq., Ann. Soc. Ent. Fr. p. 438, pl. xv. (1837). [*Pangonia furcata*, Wiedem., l. c.]—*Hab.* Brazil.

*Dicrania cervus*, Wiedem., Auss. zweifl. Ins. i. p. 94 (1828); Macq., Dipt. Exot. i. p. 110 (1838); id. Ann. Soc. Ent. Fr. pl. xv. p. 438 (1837); Giglio-Tos, Boll. Mus. Torino, xii. (1897).

*Pangonia cervus*, Wiedem., l. c.

*Pangonia cervus*, var., Wiedem., Walker, List Dipt. pt. v. Suppl. 1, p. 131 (1854).

*Pangonia comprehensa*, Walker, Dipt. Saund. pt. i. p. 11 (1850).

One female specimen is labelled in Walker's handwriting *ramicornis*; there is no record of such a species in any of his writings. He describes a *cervus*, var. ♀, in List Dipt. pt. v. Suppl. 1, p. 131, from Santarem, Brazil, Bates coll.: this *ramicornis* is thus labelled and answers to the description of the var., and is probably the fly he described as *cervus*, var.; it is identical with *cervus*, Wiedem., the only difference being in the teeth of the third joint of antennæ, which are not so deep or sharply defined, and there is an appendix on one of the wings not on the other. The *comprehensa*, ♀, Walker, and two other identical male specimens, all from the Amazons, are evidently the same as *cervus*. The male has just been described by Giglio-Tos in the above paper, from one specimen received from Ecuador; the very long proboscis he lays so much stress upon, is (apparently) only present in one of these male specimens.

*Hab.* Para, Santarem (*Bates*).

*CADICERA*, Macq., Dipt. Exot. Suppl. 5, p. 23 (1855).

This genus, formed for one species from Oceania, should include *Pangonia melanopyga* and *crassipalpis*, Macq., and *chryso stigma*, Wiedem. It is distinguished by the low insertion of the antennæ, the large, thick, curved, second joint of palpi, and the broad and convex abdomen and short proboscis. Ocelli are present. Wings have the first posterior cell closed and an appendix on branch of third vein.

\**Cadicera rubra marginata*, ♀, Macq., Dipt. Exot. Suppl. 5, p. 23 (1855). The type of the genus.

The palpi are very large; ocelli present and distinct, though Macquart says "no distinct ocelli"; his plate of this species

is not exact. The specimen in the Museum came from South Africa, not Oceania, whence Macquart says his type was received.

*Hab.* South Africa (*Smith*).

\**Cadicera melanopyga*, ♂, Wiedem., Auss. zweifl. Ins. i. p. 98 (1828).

*Pangonia melanopyga*, Wiedem., *l. c.*; ♀, Macq. Dipt. Exot. i. p. 97 (1838); Loew, Dipt. Südafrik. p. 19 (1860); Walker, List Dipt. pt. i. p. 136 (1848).

*Hab.* Cape of Good Hope (*Smith*, *Whitehill*).

\**Cadicera crassipalpis*, Macq. Dipt. Exot. i. p. 98 (1838).

*Pangonia crassipalpis*, Macq., *l. c.*; Walker, List Dipt. pt. i. p. 138 (1848).

*Hab.* Cape of Good Hope (*Children*).

\**Cadicera chrysostigma*, Wiedem., Auss. zweifl. Ins. i. p. 100 (1828).

*Pangonia chrysostigma*, Wiedem., *l. c.*; Walker, List Dipt. pt. v. Suppl. 1, p. 137.

*Hab.* Cape of Good Hope, Stellenbosch (*Vigors*).

There is an undescribed specimen in the collection unlabelled, which probably belongs to this genus, from the Cape; and another probably new species from Pirie Bush.

#### PELECORHYNCHUS, Macq.

*Pelecorhynchus*, Macq., Dipt. Exot. Suppl. 4, p. 28 (1850); Loew, Dipt. Südafrik. (1860).

*Cænopyga*, Thoms., Eugen. Resa, p. 449 (1868).

This genus was formed by Macquart for *P. maculipennis* from Australia; he distinguished the genus from *Pangonia* by the peculiar shape of the proboscis, which ends in the form of a hatchet: Loew is doubtful as to this being a good characteristic for a genus, though Schiner, in describing *P. ornatus* ('Reise der Novara,' p. 98), mentions this as justifying the genus being established; it seems peculiar to the genus so far as I can judge from the species in the Museum. Thomson formed a new genus, *Cænopyga*, for the same species, distinguishing it from *Pangonia* by its subulated antennæ and the posterior spiracles being ovate not horizontal. Macquart's name has priority, though he gives an insufficient and incorrect description for his genus. Thomson's should be referred to: his statement "wings many-spotted" will only hold good for some species, not for the genus, some having quite clear wings; his distinction as to spiracles I have not been able to

verify. The open anal cell and anal vein curved seems a distinguishing characteristic and should be added to the shape of proboscis and antennæ as distinctive for the genus. Three species placed by Walker under *Silvius* belong here, and two new species from S. America, bringing the number of described species of the genus up to six.

\**Pelecorhynchus maculipennis*, Macq., Dipt. Exot. Suppl. 4, p. 28 (1850). [*Cænopynga maculipennis*, Thoms. l. c.]

A male and female, both in bad preservation, which were unnamed.

*Hab.* Sydney, Australia, and Tasmania.

\**Pelecorhynchus personatus*, Walker, List Dipt. pt. i. p. 192 (1848).

*Silvius personatus*, Walker, l. c.

*Pelecorhynchus ornatus*, Schiner, Reise der Novara, p. 98 (1866); Will. Kans. Univ. Quart. vol. iii. (1895).

This and the two following species were placed by Walker under *Silvius*, with the remark that they would form a genus which approaches *Anthrax*. Schiner redescribed this species, placing it under *Pelecorhynchus*.

*Hab.* Queensland (*Hunter, Cumming*).

\**Pelecorhynchus eristoloides*, ♂, Walker, List Dipt. pt. i. p. 193 (1848).

*Silvius eristoloides*, Walker, l. c.

*Hab.* Australia, S.E. Tasmania (*Atkinson*).

\**Pelecorhynchus fusconiger*, ♀, Walker, List Dipt. pt. i. p. 192 (1848).

*Silvius fusconiger*, Walker, l. c.

*Hab.* New South Wales; Australia (*Hunter*).

\**Pelecorhynchus Darwini*, ♀, sp. n. (Pl. I. fig. 1.)

This handsome species was collected by Darwin from Chiloe, S.W. coast of South America. There is only one specimen.

Black. Antennæ subulated; palpi short, reddish brown, with black hairs. Face grey, with brown markings in the centre and frontal stripe brown. Ocelli present; beard bright orange-yellow. Thorax with two distinct silky yellow stripes extending to scutellum; dorsum clothed with short black pubescence; sides with orange-yellow hairs, which are also

present at base of wings and on breast. Scutellum with a fringe of short silky yellow hairs. Halteres yellow. Abdomen clothed with black pubescence; a small hoary grey spot on each side of the third segment and a large oblong one on the fourth segment, extending from each side towards the middle; these spots are still more distinct on the underside of abdomen, forming a wave-like band on the fourth segment. Legs black; anterior tibia with greyish pubescence. Wings hyaline, yellow at base and on the fore border; veins yellow. Posterior cells open, also the anal cell; the anal vein is curved. Length 15 millim.

*Hab.* Chiloe, S. America.

\**Pelecorhynchus aurantiacus*, ♀, sp. n. (Pl. I. fig. 2.)

Reddish brown. Antennæ and palpi red; the latter short, clothed with orange-yellow hairs; the beard and hairs on the breast are the same colour; the face and frontal stripe are light ferruginous, clothed with short yellow pubescence. Thorax covered with orange-rufous hairs, very deep in colour on the sides and on the scutellum; there is a large tuft of white hairs below the root of the wings. Abdomen clothed with dense orange-rufous pubescence; the last segment is rather bare, with wrinkled transverse lines. Legs yellow, the posterior tibia red. Wings hyaline, yellow at base and on the fore border; transverse veins slightly clouded. All posterior cells and the anal one open; anal vein curved. Length 15 millim.

*Hab.* Chili (*Edmonds*).

This may perhaps be the same as *Pangonia vulpes*, Macq., Dipt. Exot. Suppl. 4, p. 23, but he takes no notice of the generic characteristics, though a few pages later he describes *Pelecorhynchus* as a new genus.

### SCIONE, Walker.

*Scione*, Walker, Dipt. Saund. pt. i. p. 11 (1850).

*Dielsia*, Schiner, Reise der Novara (1866); Verh. zool.-bot. Ges. Wien, xvii. p. 310 (1867).

This genus was formed by Walker for *Pangonia incompleta*, Macq., who based it on the venation of the wings, the fourth posterior cell being closed, besides the first posterior, and the dividing nerve between the second and third posterior cell interrupted. Schiner did not consider he was obliged to make use of the name *Scione*, but established *Dielsia* for the same *P. incompleta* and included two new species, *D. maculipennis* and *distincta*. *Pangonia singularis* and *albifasciata*,

Macq., he considered should be included in it. Giglio-Tos, in Ann. Soc. Ent. Fr. p. 357 (1895), reverts to the name *Scione* established by Walker and accepted by Rondani (Archiv. Canestr. iii. 1863) for *Pangonia incompleta* and *singularis*, Macq.; though he does not consider the closing of the two posterior cells sufficient to distinguish this genus, the species which should belong to it presenting other wide differences, he accepts it for the present, and places a new species, *S. Alluaudi*, here. He thinks *Pangonia biclausula*, Schiner, should be placed in this genus.

Schiner's description of *Diclisia* should be referred to for the genus, which at present would include species widely different in appearance, form of palpi, &c. Two species in the Museum Coll. should be included, viz. *Pangonia brevis*, Loew, and *Pangonia submacula*, Walker, having the fourth posterior cell closed; but they do not agree in other particulars with the description of the genus, and *P. submacula* is so clearly allied to *Pangonia guttata* that it does not seem advisable to remove them from *Pangonia*.

The described species placed in this genus are:—

- \**Scione incompleta*, Macq., Dipt. Exot. Suppl. 1, p. 28 (1846); id. *l. c.* Suppl. 4, p. 25 (1850); Walker, Dipt. Saund. pt. i. p. 20 (1850); id. List Dipt. pt. v. Suppl. 1, p. 125 (1854); Gigl.-Tos, Ann. Soc. Ent. Fr. p. 357 (1895). [*Pangonia incompleta*, Macq., *l. c.* *Diclisia incompleta*, Schiner, Reise der Novara, p. 101 (1866).]—*Hab.* South America.
- Scione singularis*, Macq., Dipt. Exot. Suppl. 1, p. 23 (1846). [*Pangonia singularis*, Macq., *l. c.*]—*Hab.* Australia.
- Scione albifasciata*, Macq., Dipt. Exot. Suppl. 1, p. 28 (1846); Walker, List Dipt. pt. v. Suppl. 1, p. 127 (1854). [*Pangonia albifasciata*, Macq., *l. c.*]—*Hab.* New Granada, S. America.
- Scione maculipennis*, Schiner, Reise der Novara, p. 102 (1866); Osten Sacken, Biol. Centr.-Am., Dipt. i. p. 47 (1886). [*Diclisia maculipennis*, Schiner, *l. c.*]—*Hab.* South America.
- Scione distincta*, Schiner, Reise der Novara, p. 102 (1866). [*Diclisia distincta*, Schiner, *l. c.*]—*Hab.* South America.
- Scione misera*, Osten Sacken, Biol. Centr.-Am., Dipt. i. p. 47 (1886). [*Diclisia misera*, Osten Sacken, *l. c.*]—*Hab.* South America.
- Scione Alluaudi*, Giglio-Tos, Ann. Soc. Ent. Fr. (1895).—*Hab.* Seychelles Islands.

- \**Scione incompleta*, Macq., Dipt. Exot. Suppl. 1, p. 28 (1846), Suppl. 4, p. 25 (1850); Walker, Dipt. Saund. pt. i. p. 20 (1850); id. List Dipt. pt. v. Suppl. 1, p. 125 (1854); Giglio-Tos, Ann. Soc. Ent. Fr. p. 357 (1895).

*Pangonia incompleta*, Macq., Dipt. Exot. *l. c.*

*Diclisia incompleta*, Schiner, Reise der Novara, p. 101 (1866).

Two females, from Colombia.



Four female specimens from British Guiana in a private collection which I examined are allied to *Sciõne albifasciata* Macq. (*Pangonia albifasciata*, Macq.), but not the same: they probably represent a new species; they have the striped thorax &c. typical of the genus, according to the type, *S. incompleta*.

## PANGONIA, Latr.

*Pangonia*, Latr. Hist. Nat. iii. p. 437 (1802).

Rondani, in Archiv. Canestr. iii. (1863), divides *Pangonia*, Latr., into *Pangonia* and *Diatomineura*, making the first posterior cell open or shut the distinctive character, and subdivides each again into a subgenus, with the eyes hairy or bare. Loew in his 'Dipt.-Faun. Südafr.' used the divisions of the posterior cells, and Bigot has used Rondani's divisions since for new species (see Mém. Soc. Zool. Fr. v. 1892). I have followed this arrangement as it seems fairly satisfactory, though the closing of the first posterior cell is a variable characteristic in some species I have come across, viz. *adrel*, White, MS., *concolor*, Walker, *depressa*, Macq., noticed by the latter in his description of *depressa*. The prolongations on the fore tarsi of some male species are confined to those from Africa so far as the species in the Museum are concerned—*longirostris*, Hardw., from Asia, being an exception, in the description of this last is the only notice of the peculiarity which I have seen.

The following is a list of the described species of African *Pangonia*, Latr., divided into their subgenera as far as possible; but many of the descriptions are insufficient, where this is the case they are left under *Pangonia*, Latr. Those marked with an asterisk (\*) are in the Africa Museum Collection.

## PANGONIA, Rond. Archiv. Canestr. iii. (1863).

- \**P. rostrata*, ♀, Linn., Mus. Lud. Utr. p. 421. 1; Wiedem., Auss. zweifl. Ins. i. p. 96 (1828); Walker, List Dipt. pt. v. Suppl. 1, p. 134 (1854); Loew, Dipt. Südafrik. p. 20 (1860).—*Hab.* Cape of Good Hope.
- \**P. angulata*, Fabr. Syst. Antl. p. 91. 5 (1805); Wiedem., Auss. zweifl. Ins. i. p. 97 (1828); Loew, Dipt. Südafrik. p. 20 (1860). [*P. obesa*, Walker, List Dipt. pt. v. Suppl. 1, p. 135 (1854); Schiner, Reise der Novara, p. 99 (1866).]—*Hab.* Cape of Good Hope.
- \**P. glosa*, Wiedem., Auss. zweifl. Ins. i. p. 99 (1828).—*Hab.* Cape of Good Hope.
- \**P. bifasciata*, Wiedem., l. c. p. 102.—*Hab.* Cape of Good Hope, Burghersdorp.
- P. atricornis*, Wiedem., l. c. p. 103; Walker, List Dipt. pt. v. Suppl. 1, p. 135 (1854); Loew, Dipt. Südafrik. p. 19 (1860). [*P. cingulata*, Wiedem., l. c.]—*Hab.* Cape of Good Hope.
- P. basalis*, Macq., Dipt. Exot. Suppl. 2, p. 10 (1846); Walker, List Dipt. pt. v. Suppl. 1, pp. 139, 323 (1854).—*Hab.* Algeria.

- P. caffra*, Macq., *l. c.* p. 11; Walker, *l. c.* p. 135; Loew, Dipt. Südafrik. p. 20 (1860).—*Hab.* Cape of Good Hope.
- \**P. multifascia*, ♀, Walker, *l. c.* pt. i. p. 134 (1848).—*Hab.* Cape of Good Hope.
- \**P. adjuncta*, ♀, Walker, *l. c.* p. 135.—*Hab.* Cape of Good Hope.
- \**P. conjuncta*, Walker, *l. c.* p. 135.—*Hab.* Cape of Good Hope.
- \**P. serfasciata*, ♀, Walker, *l. c.* p. 136.—*Hab.* Cape of Good Hope.
- \**P. alboatra*, ♀, Walker, Dipt. Saund. pt. i. p. 13 (1850).—*Hab.* Cape of Good Hope.
- P. biclausia*, Loew, Dipt. Südafrik. p. 19 (1860).—*Hab.* Caffraria (*Wahlberg*).
- \**P. brevis*, Loew, Wiener ent. M. vii. p. 9 (1863).—*Hab.* Orange Free State.
- P. Ruppellii*, Jænnicke, Abh. Senck. Gesell. vi. p. 329 (1868).—*Hab.* Simen, Abyssinia.
- P. bullata*, Will., Kans. Univ. Quart. iii. p. 191 (1895).—*Hab.* South Africa.
- P. Brichetti*, Bizzi, Ann. Mus. Genova, xii. (2) p. 181.—*Hab.* Somaliland.

Subgenus EREPHROSIS, Rond. Archiv. Canestr. iii. (1863).

- E. maculipennis*, Macq., Dipt. Exot. Suppl. 4, p. 20 (1850); Schiner, Reise der Novara, p. 98 (1866).—*Hab.* Africa.

DIATOMINEURA, Rond. Archiv. Canestr. iii. (1863).

- \**D. barbata*, ♀, Linn., Mus. Lud. Ulr. p. 422. 2; id. Syst. Nat. i. p. 999. 2 (1766); Wiedem., Auss. zweifl. Ins. i. p. 94 (1828); Walker, List Dipt. pt. i. p. 135 (1848), pt. v. Suppl. 1, p. 135 (1854).—*Hab.* Cape of Good Hope.
- \**D. fulvifascia*, ♀, Walker, List Dipt. pt. i. p. 137 (1848).—*Hab.* Cape of Good Hope.

Subgenus CORIZONEURA, Rond. Archiv. Canestr. iii. (1863).

- \**C. lateralis*, Fabr., Syst. Antl. p. 91. 4 (1805); Wiedem., Auss. zweifl. Ins. i. p. 101 (1828); Walker, List Dipt. pt. i. p. 134 (1848), pt. v. Suppl. 1, p. 135 (1854); Loew, Dipt. Südafrik. p. 17 (1860).—*Hab.* Cape of Good Hope.
- \**C. varicolor*, Wiedem., *l. c.* p. 98; Walker, List Dipt. pt. i. p. 134 (1848), pt. v. Suppl. 1, p. 137 (1854); Loew, Dipt. Südafrik. p. 17 (1860).—*Hab.* Cape of Good Hope.
- \**C. parva*, ♀, Walker, List Dipt. pt. i. p. 145 (1848).—*Hab.* Cape of Good Hope.
- \**C. subfascia*, ♂, Walker, *l. c.* pt. v. Suppl. 1, p. 136 (1854).—*Hab.* Port Natal.
- \**C. directa*, ♀, Walker, Dipt. Saund. pt. i. p. 21 (1850).—*Hab.* Cape of Good Hope.
- \**C. brunnipennis*, Loew, Dipt. Südafrik. p. 17 (1860).—*Hab.* Port Natal.
- \**C. suavis*, Loew, *l. c.* p. 17.—*Hab.* Caffraria (*Wahlberg*).
- C. zig-zag*, Macq., Dipt. Exot. Suppl. 5, p. 20 (1850); Karsch, Berlin. ent. Zeit. xxviii. p. 171 (1884).—*Hab.* Central Madagascar.
- C. albifrons*, Bigot, Mém. Soc. Zool. Fr. v. p. 612 (1892).—*Hab.* Cape of Good Hope.
- C. brachyrhyncha*, Bigot, *l. c.* p. 614.—*Hab.* Cape of Good Hope.
- \**C. pallidipennis*, ♀, sp. n.—*Hab.* Delagoa Bay.
- \**C. umbratipeunis*, sp. n.—*Hab.* Annshaw (*Barrett*).

PANGONIA, Latr. Hist. Nat. iii. p. 437 (1802).

- P. leucomelas*, Wiedem., Auss. zweifl. Ins. i. p. 90 (1828); Walker, List Dipt. pt. i. p. 136 (1848).—*Hab.* Cape of Good Hope.  
*P. thoracica*, Wiedem., *l. c.* p. 89; Walker, *l. c.* pt. v. Suppl. 1, p. 139 (1854) (name twice chosen).—*Hab.* Cape of Good Hope.  
*P. nobilis*, Wiedem., *l. c.* ii. p. 622; Walker, *l. c.*—*Hab.* Cape of Good Hope.  
*P. spiloptera*, Wiedem., *l. c.* p. 102; Walker, *l. c.* pt. i. p. 136 (1848).—*Hab.* Cape of Good Hope.  
*P. senegalensis*, Macq., Hist. Nat. Dipt. i. p. 193 (1834); Walker, *l. c.* pt. v. Suppl. 1, p. 137 (1854).—*Hab.* Senegal.  
*P. chrysopila*, Macq., *l. c.* p. 194; Walker, *l. c.*—*Hab.* Africa.  
*P. flavipes*, Macq., Dipt. Exot. i. p. 98 (1838).—*Hab.* Cape of Good Hope.  
*P. appendiculata*, Macq., *l. c.* p. 97; Walker, *l. c.*—*Hab.* Cape of Good Hope.  
*P. funebris*, Macq., *l. c.* Suppl. 1, p. 23 (1846).—*Hab.* Algeria.  
*P. ramulifera*, ♀, Loew, Wiener ent. M. vii. p. 9 (1863).—*Hab.* Orange State.  
*P. semilivida*, Bigot, Ann. Soc. Ent. Fr. lx. p. 366 (1891). [*Sackenymia semilivida*, Bigot, *l. c.*]—*Hab.* West Africa.

PANGONIA, Latr.

PANGONIA, Rond.

*Wings* with first posterior cell closed. *Eyes* naked or subnaked.

*Pangonia conjuncta*, ♂ ♀, Walker, List Dipt. pt. i. p. 135 (1848)

Palpi with first joint stout; second joint long and slender, pointed. Wings with an appendix on fork of the third vein, and also one on the apex of the first posterior cell.

*Hab.* Cape of Good Hope.

*Pangonia alboatra*, ♀, Walker, Dipt. Saund. pt. i. p. 13 (1850).

Palpi with second joint club-shaped at base, ending in a point. Wings with appendix on fork of third vein.

*Hab.* Cape of Good Hope.

*Pangonia angulata*, Fabr., Syst. Antl. p. 91. 5 (1805); Wiedem., Auss. zweifl. Ins. i. p. 97 (1828); Loew, Dipt. Südafrik. p. 20 (1860).

*P. obesa*, Walker, List Dipt. pt. v. Suppl. 1, p. 135 (1854); Schiner, Reise der Novara, p. 99 (1866).

Walker's type *obesa*, ♀, from Saunders Coll., seems identical with *angulata*, Fabr., agreeing with the amended description of *angulata* by Loew, who notes a female var., placed by

Wiedemann under *angulata*, and having the extra appendix on the first posterior cell; *obesa* must therefore sink.

There is a male specimen here, evidently this species, though it has no appendix on the first posterior cell, which apparently varies in the same species, as in *sexfasciata*, Walker. The palpi are similar to those of *alboatra*.

*Hab.* Cape of Good Hope.

*Pangonia sexfasciata*, ♀, Walker, Cat. Dipt. pt. i. p. 136 (1848).

Palpi as in *alboatra*. Wings have an appendix on the apex of first posterior cell on one wing only.

*Hab.* Cape of Good Hope.

*Pangonia gulosa*, Wiedem., Auss. zweifl. Ins. i. p. 99 (1828).

Palpi with second joint shorter than the first.

*Hab.* Cape of Good Hope.

*Pangonia rostrata*, ♀, Linn., Mus. Lud. Ulr. p. 421. 1; Wiedem., Auss. zweifl. Ins. i. p. 96 (1828); Walker, Cat. Dipt. pt. v. Suppl. 1, p. 134 (1854); Loew, Dipt. Südafrik. p. 20 (1860).

*Hab.* Cape of Good Hope.

*Pangonia multifascia*, ♀, Walker, Cat. Dipt. pt. i. p. 134 (1848).

Palpi slender; second joint not quite so long as the first. Wings with appendix on fork of third vein.

*Hab.* Cape of Good Hope.

*Pangonia adjuncta*, ♀, Walker, Cat. Dipt. pt. i. p. 135 (1848).

Palpi rather stout; joints almost equal in length; the second joint club-shaped at base, ending in a point. Wings with an appendix on fork of third vein.

*Hab.* Cape of Good Hope.

*Pangonia bifasciata*, Wiedem., Auss. zweifl. Ins. i. p. 102 (1828).

The white band on second segment of abdomen, mentioned by Wiedemann, resolves itself, in one male specimen and two female specimens in the collection, into two lateral and one

dorsal white spot. Wiedemann only described the female. The male in the Museum has a prolongation on the second joint of the fore tarsi, reaching to the end of the third joint, with long hairs on its apex. One of the females was wrongly labelled as *flavipes*, Macq.

*Hab.* Cape of Good Hope, Burghersdorp.

*Pangonia brevis*, Loew, Wiener ent. M. Bd. vii. p. 9 (1863).

One male.

This species has the fourth posterior cell closed, and should therefore be placed in the genus *Scione*, Walker (*Diclisia*, Schiner); but as it differs in the form of the palpi and other particulars from the description of that genus, it does not seem advisable to remove it from *Pangonia* for the present.

*Hab.* Transvaal (*Young*).

#### DIATOMINEURA, Rond.

*Wings* with first posterior cell open. *Eyes* hairy.

*Diatomineura fulvifascia*, ♀, Walker, List Dipt. pt. i. p. 137 (1848).

Palpi with second joint rather long, club-shaped at base, ending in a point. The tawny hind borders of segments of abdomen have golden pubescence. Wings have no appendix.

*Hab.* Cape of Good Hope.

*Diatomineura barbata*, ♀, Linn., Mus. Lud. Ulr. p. 422. 2; Syst. Nat. i. p. 999. 2; Wiedem., Auss. zweifl. Ins. i. p. 94 (1828); Walker, List Dipt. pt. i. p. 135 (1848), pt. v. Suppl. 1, p. 135 (1854).

*Hab.* Cape of Good Hope.

#### Subgenus CORIZONEURA, Rond.

*Wings* with first posterior cell open. *Eyes* naked or subnaked.

*Corizoneura lateralis*, ♂ ♀, Fabr., Syst. Antl. p. 91. 4 (1805); Wiedem., Auss. zweifl. Ins. i. p. 101 (1828); Loew, Dipt. Südafrik. p. 17 (1860); Walker, List Dipt. pt. i. p. 134, pt. v. Suppl. 1, p. 135 (1854).

*Hab.* South Africa.

*Corizoneura subfascia*, ♂, Walker, List Dipt. pt. v. Suppl. 1, p. 136 (1854).

Wings have an appendix on fork of third vein.

*Hab.* Port Natal, Durban (*Distant*).

*Corizoneura brunnipennis*, Loew, Dipt. Südafrik. i. p. 17 (1860).

Two females which were unnamed; the veins and fore borders of wings are yellow, not dull grey smoky-brown as Loew says.

*Hab.* Port Natal.

*Corizoneura suavis*, Loew, Dipt. Südafrik. i. p. 17 (1860).

Two females.

*Hab.* Potchefstroom, Transvaal.

*Corizoneura varicolor*, ♂ ♀, Wiedem., Auss. zweifl. Ins. i. p. 98 (1828); Walker, List Dipt. pt. i. p. 134 (1848), pt. v. Suppl. 1, p. 137 (1854); Loew, Dipt. Südafrik. i. p. 17 (1860).

The male has not been described. There is one male in the Museum from the Transvaal which answers to Wiedemann's description in every particular, but has the prolongations on the fore tarsi, viz. from the extremity of the first joint of tarsus there is the first prolongation, overlapping a second one, which starts from the base of the extremely short second joint and continues beyond the third; both are yellow in colour as the legs. There is another male rather larger, which was wrongly labelled *P. appendiculata*, Macq., from South Africa, and five females so labelled; the hairs on the second and fourth segments of abdomen are hardly apparent in some of the specimens, which are old and rubbed.

*Hab.* South Africa, Natal, Transvaal

*Corizoneura pallidipennis*, ♀, sp. n. (Pl. I. fig. 3.)

Light fulvous. The upper part of the face is covered with greyish tomentum; longitudinal furrows on the vertex. Antennæ red, the first two joints are greyish. Beard white. Palpi red; a short furrow on the upper end of the last joint, which is only half as long as the first and is club-shaped. Proboscis a little longer than body. Thorax brown, covered with short yellow pubescence, fringed at sides with yellow hairs, with tufts of white hairs above wings reaching to

scutellum. Abdomen fulvous, with interrupted black dorsal stripe; on middle of posterior margin of second segment a tuft of white hairs; remaining segments brownish, with a few black spots and markings; at sides of second, fourth, sixth, and seventh segments are white hairs, on the others black hairs; underside of abdomen covered with whitish pubescence. Wings hyaline, with appendix on fork of third vein; the veins are light yellow. Legs yellow, coxæ black. Length 13-14 millim.

*Hab.* Delagoa Bay.

*Corizoneura umbratipennis*, ♂ ♀, sp. n. (Pl. I. fig. 9.)

Fulvous. Face reddish with grey tomentum; in female three deep longitudinal furrows in centre of forehead and transverse wrinkles below, a faint longitudinal stripe extending from these to below the antennæ. Beard white. Antennæ and palpi red, the latter with a short deep furrow on face of the third joint, which is club-shaped and shorter than the first joint. Ocelli absent. Proboscis nearly twice as long as the body. Thorax thickly clothed with dark hairs, sides with white, extending to the base of the scutellum. Abdomen fulvous, with black dorsal stripe on the first segment and base of the second, the third has black markings; the posterior borders of segments two and three are lighter in colour, the remaining segments dark; a tuft of white hairs on lateral margins of segments two, four, six, seven, the others with black hairs. Underside of abdomen light fulvous with whitish tomentum. Legs red, posterior ones dark brown; on the fore tarsi of the male there is a slender prolongation, starting from the base of the second and extending nearly to the end of the third joint; there are two long bristles on the end of the first joint. Wings grey; veins brown, the transverse ones shadowed. Length 15-16 millim.

This species somewhat resembles *varicolor*, Wiedem., but the longer proboscis and absence of hairs on the second and fourth segments distinguish it.

*Hab.* Annshaw, South Africa (*Barrett*).

*Corizoneura directa*, ♀, Walker, Dipt. Saund. pt. i. p. 21 (1850).

In very poor preservation.

*Hab.* Cape of Good Hope.

*Corizoneura parva*, ♀, Walker, List Dipt. pt. i. p. 145 (1848).

In very poor preservation.

*Hab.* Cape of Good Hope.

*Australia*  
(including Oceania, New Guinea, and New Zealand).

PANGONIA, Latr.

PANGONIA, Rond.

- P. fulviventris*, Macq., Dipt. Exot. i. p. 109 (1838); Walker, List Dipt. pt. v. Suppl. 1, p. 144 (1854).—*Hab.* Australia.  
*P. fuscipennis*, Macq., *l. c.* Suppl. 5, p. 18 (1855).—*Hab.* Cape of Needles, Oceania.

Subgenus EREPHROSIS, Rond.

- \**E. guttata*, Donovan. [*Tabanus guttatus*, Donovan, Illust. Ent. i. Hym. et Dipt. (1806); Guérin, Voyage de la Coquille, ii. pt. 2, p. 289 (1830); *l. c.* Atlas Ins. pl. 20; Wiedem., Auss. zweifl. Ins. i. p. 194 (1830); Walker, List Dipt. pt. i. p. 141 (1848). *Pangonia margaritifera*, Wiedem., *l. c.* p. 88; Macq., Dipt. Exot. Suppl. 3, p. 8 (1847); Williston, Kans. Univ. Quart. iii. (1895).]—*Hab.* Sydney.  
\**E. macroporum*, Macq., Dipt. Exot. i. p. 101 (1838); Walker, List Dipt. pt. v. Suppl. 1, p. 143 (1854).—*Hab.* Kangaroo Island.  
\**E. Jacksonii*, Macq., Dipt. Exot. i. p. 102 (1838).—*Hab.* Port Jackson.  
*E. bicolor*, Macq., *l. c.* Suppl. 1, p. 24 (1846); Walker, *l. c.* p. 142 (1854).—*Hab.* Australia.  
*E. limbinervis*, Macq., *l. c.* Suppl. 5, p. 21 (1855).—*Hab.* Sydney.  
*E. albonotata*, Macq., *l. c.*—*Hab.* Sydney.  
\**E. media*, ♀, Walker, *l. c.* pt. i. p. 142 (1848).—*Hab.* Australia.  
\**E. submacula*, ♀, Walker, *l. c.*; id. Dipt. Saund. pt. i. p. 13 (1850).—*Hab.* Swan River.  
\**E. quadrimacula*, ♀, Walker, List Dipt. pt. i. p. 138 (1848).—*Hab.* Australia.  
\**E. contigua*, Walker, *l. c.*—*Hab.* Australia.  
\**E. gemina*, ♀, Walker, *l. c.*—*Hab.* Australia.  
\**E. gibbula*, Walker, *l. c.* p. 140.—*Hab.* West Australia.  
\**E. tricolor*, ♀, Walker, *l. c.* p. 139.—*Hab.* West Australia.  
\**E. divisa*, ♀, Walker, Dipt. Saund. pt. i. p. 17 (1850).—*Hab.* West Australia.  
\**E. adrel*, White, MS., Walker, *l. c.* p. 16; Walker, List Dipt. pt. i. p. 141. [*Tabanus adrel*, White, MS., Butler, Cist. Ent. i. p. 355 (1876).]—*Hab.* New Zealand.  
*E. dilatata*, Jænnicke, Abh. Senck. Gesell. vi. p. 328 (1868).—*Hab.* Australia.  
*E. vertebrata*, Bigot, Mém. Soc. Zool. Fr. v. p. 618 (1892).—*Hab.* Australia.  
\**E. aureohirta*, ♀, sp. n.—*Hab.* Mackay, Queensland.

DIATOMNEURA, Rond.

- D. auriflua*, ♀, Donovan, Gen. Illust. Ent. pt. i. (1805). [*Tabanus aurifluus*, Donovan, *l. c.* *Pangonia solida*, ♀, Walker, List Dipt. pt. i. p. 141 (1848).]—*Hab.* New South Wales (*Don.*), Port Stephen (*Walker*).



- \**D. jacksoniensis*, ♀, Guérin, Voyage de la Coquille, ii. pt. 2, p. 289 (1830); *l. c.* Atlas, Ins. pl. 20. 3.—*Hab.* Port Jackson, New South Wales.
- D. testacea*, Macq., Dipt. Exot. i. p. 99 (1838); Walker, List Dipt. pt. v. Suppl. 1, p. 145 (1854).—*Hab.* Australia.
- D. aurata*, Macq., *l. c.* p. 100; id. Ann. Soc. Ent. Fr. vi. p. 429, pl. 15 (1837); Walker, *l. c.* pt. i. p. 141 (1848).—*Hab.* Tasmania and Australia.
- D. clavata*, Macq., *l. c.* p. 101.—*Hab.* Australia.
- D. ruficornis*, Macq., *l. c.* Suppl. 1, p. 26 (1846); Walker, *l. c.* pt. v. Suppl. 1, p. 142 (1854).—*Hab.* Tasmania.
- D. albicostata*, Macq., *l. c.* p. 24; Walker, *l. c.* p. 144 (1854).—*Hab.* Australia.
- D. subappendiculata*, Macq., *l. c.* Suppl. 4, p. 20 (1850).—*Hab.* Tasmania.
- D. testaceo-maculata*, Macq., *l. c.* p. 21.—*Hab.* Australia.
- D. brevirostris*, Macq., *l. c.* p. 23.—*Hab.* Australia.
- D. dorsomaculata*, Macq., *l. c.* p. 22.—*Hab.* Tasmania.
- D. violacea*, Macq., *l. c.*—*Hab.* Tasmania.
- \**D. patula*, ♂, Walker, List Dipt. pt. i. p. 144 (1848).—*Hab.* ? Australia.
- \**D. crassa*, ♀, Walker, *l. c.*—*Hab.* Australia.
- \**D. plana*, ♀, Walker, *l. c.*—*Hab.* Australia.
- \**D. gemella*, ♀, Walker, *l. c.* p. 139.—*Hab.* Australia.
- \**D. constans*, ♀, Walker, Dipt. Saund. pt. i. p. 15 (1850).—*Hab.* Tasmania.
- \**D. concolor*, Walker, *l. c.* p. 14.—*Hab.* Australia.
- \**D. lerda*, White, MS., Walker, *l. c.* p. 16; Walker, List Dipt. pt. i. p. 141 (1848). [*Tabanus lerda*, White, MS., Butler, Cist. Ent. i. p. 355 (1876).]—*Hab.* New Zealand.
- \**D. caliginosa*, ♀, Walker, Proc. Linn. Soc. viii. p. 108 (1865).—*Hab.* New Guinea.
- ? *D. carnea*, Bigot, Mém. Soc. Zool. Fr. v. p. 618 (1892).—*Hab.* Australia.
- ? *D. gaganina*, Bigot, *l. c.* p. 620.—*Hab.* Australia.
- \**D. minima*, ♂ ♀, sp. n.—*Hab.* Queensland.

## Subgenus CORIZONEURA, Rond.

- C. dives*, Macq., Dipt. Exot. Suppl. 1, p. 25 (1846); Walker, List Dipt. pt. v. Suppl. 1, p. 142 (1854).—*Hab.* Tasmania.
- C. angusta*, Macq., *l. c.* Suppl. 2, p. 11; Walker, *l. c.* p. 144.—*Hab.* Australia.
- C. brevipalpis*, Macq., *l. c.* Suppl. 3, p. 8; Walker, *l. c.*—*Hab.* Australia.
- C. rufovittata*, Macq., *l. c.* Suppl. 4, p. 19.—*Hab.* Tasmania.
- \**C. fulva*, Macq., *l. c.*—*Hab.* Australia.
- C. anthracina*, Macq., *l. c.* p. 22.—*Hab.* Tasmania.
- C. alternans*, Macq., *l. c.* Suppl. 5, p. 19 (1855).—*Hab.* Cape of Needles, Oceania.
- C. sulcifrons*, Macq., *l. c.* p. 20.—*Hab.* Cape of Needles, Oceania.
- \**C. erratica*, ♂, Walker, List Dipt. pt. i. p. 189 (1848). [*Tabanus erraticus*, Walker, *l. c.*]—*Hab.* Australia.
- \**C. chrysofila*, ♀, Walker, *l. c.* p. 155. [*Tabanus chrysophilus*, Walker, *l. c.* *Pangonia aurofasciata*, Jænnicke, Abh. Senck. Gesell. vi. p. 327 (1868).]—*Hab.* Australia.
- C. nigrosignata*, Thomson, Eugen. Resa, p. 451 (1868).—*Hab.* Sydney.
- C. neocaledonia*, Mégnin, Bull. Soc. Ent. Fr. (5) viii. p. 145 (1878); *l. c.* ix. p. 61 (1879); *l. c.* (6) iii. p. 139 (1883).—*Hab.* New Caledonia.

- C. nigricornis*, Bigot, Mém. Soc. Zool. Fr. v. p. 614 (1892).—*Hab.* Australia.  
 ? *C. rubiginosa*, Bigot, *l. c.* p. 615.—*Hab.* Australia.  
*C. leucopicta*, Bigot, *l. c.*—*Hab.* New Caledonia.  
*C. trichocera*, Bigot, *l. c.* p. 616.—*Hab.* Australia.  
*C. angusta*, Bigot, *l. c.* p. 617.—*Hab.* Australia.

## PANGONIA, Latr.

- P. Roei*, King, Narr. Surv. Coasts Austral. ii. p. 467 (1827); Wiedem., Auss. zweifl. Ins. ii. p. 647 (1830); Walker, List Dipt. pt. i. p. 145 (1848); *id. l. c.* pt. v. Suppl. 1, p. 145 (1854).—*Hab.* Australia.  
*P. lasiophthalma*, Bois., Voy. Astrolabe, Zool. ii. p. 666 (1832); Macq., Hist. Nat. Dipt. i. p. 193 (1834); Walker, List Dipt. pt. v. Suppl. 1, p. 139 (1854); Wulp, Cat. Dipt. S. Asia (1893). [*P. fuliginosa*, Bois., Voy. Astrolabe, Zool. ii. p. 663 (1832).]—*Hab.* New Guinea.  
*P. maculiventris*, Westwood, London & Edinburgh Phil. Mag. (3) vi. p. 449 (1835).—*Hab.* Australia.  
*P. dorsalis*, Macq., Dipt. Exot. i. p. 100 (1833).—*Hab.* Australia.  
*P. conjungens*, ♀, Walker, *l. c.* pt. i. p. 140 (1848). This type is not to be identified in the Museum Coll.—*Hab.* Australia.

## PANGONIA, Latr.

## PANGONIA, Rond.

Subgenus EREPHROSIS, Rond.

*Wings* with first posterior cell closed. *Eyes* hairy.

*Erephosis guttata*, Donovan, Illust. Ent. i. Hym. et Dipt. (1806).

*Tabanus guttatus*, Donovan, Guérin, Voyage de la Coquille, vol. ii. pt. 2, p. 289 (1830); Atlas Ins. pl. 20; Wiedem., Auss. zweifl. Ins. i. p. 194 (1830); Walker, List Dipt. pt. i. p. 141 (1848).

*Pangonia margaritifera*, Wiedem., *l. c.* p. 88 (1830); Macq., Dipt. Exot. Suppl. 3, p. 8 (1847); Williston, Kans. Univ. Quart. iii. (1895).

The name *guttata* has priority and was kept by Walker in his Catalogue, though Macquart and Williston retained Wiedemann's name *margaritifera*. The *Tabanus guttatus* figured by Donovan is evidently the same as *P. margaritifera*, though the spurs on hind legs are not shown in the plate, and the antennæ are figured with a tooth, but in general form and markings it agrees with *margaritifera*; it is again figured by Guérin in 'Voyage de la Coquille,' Atlas, and mentioned in vol. ii. as a variety with no tooth to the antennæ and no white spots on middle of abdomen.

*Hab.* Australia, Sydney.

*Erephosis media*, ♀, Walk. List Dipt. pt. i. p. 142 (1848).

The palpi have the second joint long, club-shaped at base,

tapering to a long point. Wings with a short appendix on fork of third vein.

*Hab.* Australia.

*Erephrosis submacula*, ♀, Walker, List Dipt. pt. i. p. 142 (1818); id. Dipt. Saund. pt. i. p. 13 (1850).

Walker has described two species under this name, but the one described in Dipt. Saund. is not to be identified. The type is old and denuded of hairs. Walker's description may be amended thus, from modern specimens:—

Antennæ bright red, the first and second joints ferruginous, with black hairs. Face has a black square mark above the palpi; these latter are long and slender. Proboscis is short. Thorax with tawny hairs on sides, extending also to the scutellum. There are tufts of white hairs on the middle of the posterior borders of the first four segments of abdomen, thickest on the third and fourth; the hind segments incline to a reddish colour. Wings with first and fourth posterior cells closed; a rudimentary appendix is present on the fork of the third longitudinal vein in only one out of the four female specimens in the Museum.

This species should belong to *Scione*, Walker (*Diclisa*, Schiner), having the fourth posterior cell closed, but the head, face, and proboscis do not agree with the description of the genus (*Diclisa*, Schiner) in 'Reise der Novara,' and it is too nearly allied to the two preceding species to make it advisable to remove it from *Erephrosis* at present.

*Hab.* Swan River, King George Sound, N. & W. Australia.

*Erephrosis adrel*, ♂ ♀, White, MS., Walker, Dipt. Saund. pt. i. p. 16 (1850); Walker, List Dipt. pt. i. p. 141 (1848).

*Tabanus adrel*, White, MS., Butler, Cist. Ent. i. p. 355 (1876).

This was one of the species collected in voyage of 'Erebus' and 'Terror' and described by White in MS. only. Walker described it in Dipt. Saund. as *Pangonia adrel*, White. Butler published White's original description of it, believing it had not been published before. White placed it under *Tabanus*. Two out of the six male specimens in the Museum have the first posterior cell of wings closed, in all the others it is open; in the female specimens it also varies. In the original description there is no mention of the wing-cells; Walker says the first posterior cell is closed. In the male the sides of the first two segments of the abdomen are fulvous; the tufts of white or yellow hair on middle of abdominal segments are not

so conspicuous in the female and sometimes resolve themselves into faint bands of white or yellow hairs.

*Hab.* New Zealand.

*Erephrosis quadrimacula*, ♀, Walker, List Dipt. pt. i. p. 138 (1848).

The palpi have the second joint more than double as long as the first, large and wide, tapering to a point. Wings have no appendix.

*Hab.* Australia.

*Erephrosis contigua*, ♀, Walker, List Dipt. pt. i. p. 138 (1848).

The palpi have the second joint large and wide, concave, tapering to a point. The first and second segments of abdomen ferruginous, the transverse spots on them more black than grey. In the male the spot on first segment is not so conspicuous as in female, and that on the third segment is broken up into two round black spots: the sides of segments are fringed with hairs—on first and second yellow and black mixed, on third and fourth wholly black, on fifth and sixth yellow, the third segment almost wholly ferruginous; there are traces of white hairs on the middle of the posterior borders of segments.

*Hab.* Australia.

? *contigua*, var., Walker.—There are two males almost similar to above, but the yellow hairs on sides of abdomen are here white and conspicuous only on the last segment, the dorsal stripe on the first two segments is distinct. The legs are much darker, all the femora black, and the hind legs entirely black.

*Hab.* Queensland.

*Erephrosis aureohirta*, ♀, sp. n. (Pl. I. fig. 10.)

Black. Face brown with greyish pubescence, black stripe on forehead. Beard yellow. Antennæ ferruginous; first and second joints grey, the latter with some black hairs. Palpi ferruginous, with the second joint large and broad, concave, ending in a point, with some black hairs on margins and tip. Proboscis as long as head and thorax together. Thorax with golden pubescence on the sides. Abdomen with the first three segments reddish brown, clothed with thin golden pubescence, thicker on the posterior margins; the remaining

segments dark with black pubescence, their posterior margins lighter; sixth and seventh with tufts of white hairs at the sides. Legs black; anterior tibiæ and tarsi brown. Wings with fore border brown, and two cross-bands, the lower one darkest, extending from the border to the basal half of the discoidal cell, the upper one from the border to the apex of the discoidal cell. No appendix. Length 14 millim.

*Hab.* Mackay, Queensland (*Turner*).

*Erephrosis gemina*, ♀, Walker, List Dipt. pt. i. p. 138 (1848).

The palpi have the second joint short and broad, concave, as long as the first joint. Wings have no appendix.

Two females were wrongly labelled "*conjungens*, Walker."

*Hab.* West Australia; Perth, South Australia.

*Erephrosis macroporum*, Macq., Dipt. Exot. i. p. 101 (1838);  
Walker, List Dipt. pt. v. Suppl. 1, p. 143 (1854).

One female.

*Hab.* Kangaroo Island.

*Erephrosis divisa*, ♀, Walker, Dipt. Saund. pt. i. p. 17  
(1850).

The palpi have the second joint large and broad, concave, the same length as the first joint. Wings with no appendix.

*Hab.* West Australia.

*Erephrosis Jacksonii*, Macq., Dipt. Exot. i. p. 102 (1838).

The wings were not described by Macquart, as they were mutilated in his type:

Wings with cross-veins shadowed; in one female the first posterior cell is open on one wing, but closed as a rule.

The *Jacksonii* var. mentioned by Walker in Dipt. Saund. pt. i. p. 15 and List Dipt. pt. i. p. 140 is not to be identified.

*Hab.* Swan River, Australia.

*Erephrosis gibbula*, ♂, Walker, List Dipt. pt. i. p. 140 (1848).

The palpi have the two joints equal in length, the second one being broad and somewhat concave. Wings have an appendix on fork of third longitudinal vein.

*Hab.* West Australia.

*Erephrosis tricolor*, ♀, Walker, List Dipt. pt. i. p. 139 (1848).

The palpi have the second joint slender, curved, and

tapering to a point. Walker omits to mention that the fourth segment of abdomen is fringed with white hairs on its posterior border, and the sides of segments five and six have tufts of white hair.

*Hab.* West Australia.

#### DIATOMINEURA, Rond.

*Wings* with first posterior cell open. *Eyes* hairy.

*Diatomineura concolor*, ♀, Walker, Dipt. Saund. pt. i. p. 14 (1850).

The palpi have the second joint large and broad, tapering to a point. The male is similar to the female (the type). One of the female specimens has the first posterior cell closed at the margin on one of the wings.

*Hab.* Australia: Moreton Bay, Toowomba.

*Diatomineura caliginosa*, ♀, Walker, Proc. Linn. Soc. viii. p. 108 (1865).

Walker says "palpi piceous." They are only so at the tip and edges, otherwise the same colour as the antennæ; the second joint is large and broad, tapering to a point, curved on the upperside.

*Hab.* New Guinea.

*Diatomineura constans*, ♀, Walker, Dipt. Saund. pt. i. p. 15 (1850).

The palpi have the second joint broad and concave at the base, tapering to a point.

*Hab.* Tasmania.

*Diatomineura jacksoniensis*, ♀, Guér. Voyage de la 'Coquille,' vol. ii. pt. 2, p. 289 (1830); Atlas Ins. pl. 20. 3.

*Hab.* Melbourne.

*Diatomineura plana*, ♀, Walker, List Dipt. pt. i. p. 144 (1848).

The palpi have the second joint broad at the base, tapering to a point.

*Hab.* Australia.

*Diatomineura gemella*, ♀, Walker, List Dipt. pt. i. p. 139 (1848).

The palpi have the second joint stout at base, tapering to a

point. The legs are black, the tibia ferruginous. Wings with an appendix on fork of third longitudinal vein.

*Hab.* Australia.

*Diatomineura lerda*, White, MS., Walker, Dipt. Saund. pt. i. p. 16 (1850); Walk. List Dipt. pt. i. p. 141 (1848).

*Tabanus lerda*, White, MS., Butler, Cist. Ent. i. p. 355 (1876).

See remarks on *Erephrosis adrel*, White, which apply to this species also.

*Hab.* New Zealand.

*Diatomineura minima*, sp. n. (Pl. I. figs. 4 ♂, 5 ♀.)

One male and two females.

This may possibly be the same as *D. gagantina*, Bigot (Mém. Soc. Zool. Fr. v. p. 620, 1892), but the description is so incomplete that it is impossible to determine any fly from it (Bigot himself doubts whether his species belongs to *Diatomineura*). For the present, therefore, I prefer to regard the British Museum specimens as belonging to a distinct species.

Black (male and female). Face and forehead grey; frontal stripe on upper half of forehead black in female; black hairs on the face.

Antennæ with the first two joints grey; the third is reddish at the base, black at the tip; the palpi are reddish; in the female with black hairs, curved, broad at base, tapering to a point. Beard scanty and whitish. Thorax with black hairs at sides, and grey hairs on breast. Abdomen with fine white hairs on lateral margins of segments, in the female greyish; underside of abdomen with grey tomentum. Legs brown, whitish tomentum on the posterior femora of female. Wings dark brown, paler on the posterior borders.

Length 8 millim.

*Hab.* Sydney or Moreton Bay, Queensland.

*Diatomineura auriflua*, ♀, Donovan, Gen. Illust. Ent. pt. i. (1805).

*Tabanus aurifluus*, Don. l. c.

*Pangonia solida*, ♀, Walker, List Dipt. pt. i. p. 141 (1848).

Walker's type seems the same as *auriflua*, of which Donovan gives a plate. Walker's description should be referred to for the species, and may be amended thus as regards the abdomen. Palpi broad at base, ending in a point. Abdomen with golden or white tufts of hair on the middle of

the posterior borders of the segments, also white tufts on the lateral margins of segments 1-4, most marked on the second, becoming an oblong spot or even reaching as a narrow fringe to the tuft in centre, on 3 and 4 often very insignificant.

Two specimens, labelled "*aurata*, Macq.," and four of *solida*, Walker, belong here.

*Hab.* Sydney or Moreton Bay, Mackay, Queensland, Port Stephen, Tasmania.

*Diatomineura crassa*, ♀, Walker, List Dipt. pt. i. p. 144 (1848)

The palpi have the second joint large and broad, tapering to a point. In both sexes the posterior parts of the thorax and the scutellum are adorned with a fringe of yellowish hairs. In the male the abdomen is more fulvous in colour; in the female the yellow hairs are chiefly on the middle of the posterior borders of the segments as triangular spots, and on the lateral posterior margin of second segment there is a well-marked tuft of white hairs, overlooked by Walker.

*Hab.* Australia, Sydney or Moreton Bay.

? *Diatomineura patula*, ♂, Walker, List Dipt. pt. i. p. 144 (1848).

One male specimen in very bad condition, locality not known. It has a general resemblance to the last two species; I therefore place it under Australia for the present.

*Hab.* ? Australia.

#### Subgenus CORIZONEURA.

*Wings* with first posterior cell open. *Eyes* bare.

*Corizoneura fulva*, Macq., Dipt. Exot. Suppl. 4, p. 19 (1850).

Two male specimens, which were wrongly labelled "*Roei*, King."

*Hab.* Australia (*Lord Derby coll.* and *Lambert*).

*Corizoneura chrysophila*, ♀, Walker, List Dipt. pt. i. p. 155 (1848).

*Tabanus chrysophilus*, Walk. l. c.

*Pangonia aurofasciata*, Jænnicke, Abh. Senck. Gesellsch. vi. p. 327 (1868).

This fine species was placed by Walker among the *Tabani*. Jænnicke redescribed it fully and should be consulted: the



third joint of antennæ was gone in his type; in these three female specimens it is the same colour as the preceding ones, long and slender, its first annulation wide, the others tapering off to a point. Walker's type cannot be identified from amongst the three females.

N.B.—The name *chrysophilus* was used by Macquart (Hist. Nat. Dipt. i. p. 194) for an African species; since, however, *chrysophilus*, Walker, is differently derived, both designations may be retained.

*Hab.* Australia.

? *Corizoneura erratica*, ♂, Walker, List Dipt. pt. i. p. 189 (1848).

*Tabanus erraticus*, Walker, *l. c.*

This was placed by Walker among the *Tabani*, but it is distinctly a *Pangonia*, Latr.; the eyes apparently bare; it is in very bad condition, the antennæ broken off, one lying on the face.

*Hab.* North or north-west coast of Australia.

The *Pangonia conjungens*, ♀, Walker (List Dipt. pt. i. p. 140), from Australia, type, is missing.

The *Pangonia lurida*, ♀, Walker, is not a *Pangonia* at all; it belongs to the Tabaninæ.

[To be continued.]

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XIII.—*The Hexagonal Structure naturally formed in Cooling Beeswax, and its Influence on the Formation of the Cells of Bees.* By CHARLES DAWSON, F.G.S. &c., and S. A. WOODHEAD, B.Sc., F.C.S., &c., County Analyst, East Sussex\*.

THE hexagonal arrangement of the cells of bees has been generally ascribed to a structural instinct. The object of this paper is now to show that the form of the bee-cell is chiefly influenced by a crystalline or pseudo-crystalline hexagonal formation due to the cooling of the wax.

While experimenting with waxes and resins, one of us (Mr. Dawson) noticed that on cooling the mixture had a tendency to arrange itself in hexagonal forms, from which

\* Communicated by the Authors, having been read at the Dover Meeting of the British Association, 1899.